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XII. *Experiments and observations to prove that the beneficial effects of many medicines are produced through the medium of the circulating blood, more particularly that of the colchicum autumnale upon the gout. By Sir Everard Home, Bart. V. P. R. S. Communicated by the Society for improving animal chemistry.*

Read March 21, 1816.

A KNOWLEDGE of the readiness with which liquids pass from the stomach into the circulation, carrying along with them the impregnation of different medicines; and the readiness with which such medicines are carried off from the circulating blood, by the action of the kidneys, led Mr. BRANDE and myself to an enquiry respecting the prevention of gravel and gout, upon which subject he has laid two separate papers before the Society.

In these communications, the action of different substances on the contents of the stomach has been considered, and those substances most efficient in depriving them of the principal ingredient met with in stone and gout, are pointed out.

For the cure of gout, the eau medicinale of Husson has been most fortunately discovered to be a specific remedy, and it is now ascertained, by experiments on different people, that a vinous infusion of the colchicum autumnale, or meadow saffron, is equally so, and therefore the two medicines must be considered as the same.

To ascertain their mode of action, appeared to me an enquiry connected with the objects of this Society, which are not con-

fined to the knowledge of purely chemical combinations in the stomach, or other parts of the body, but include the effects of galvanism on the nerves, and of mineral and vegetable solutions on the blood, so far as they affect the actions of life, or the symptoms of disease.

It has already been determined by experiment, that almost every mineral, vegetable, and animal poison, if not the whole of them, is carried into the circulation before it produces its specific effects upon particular parts, whether these are the stomach, skin, or other parts of the body. The most truly specific medicine that we have been hitherto acquainted with, is mercury for the venereal disease, and it is completely established, that this remedy, when in the circulation, is equally efficient in the cure of a recent chancre produced by inoculation, and a venereal sore throat, in consequence of the disease having been carried into the circulation.

That other medicines can be received into the circulation, and, as soon as they arrive there, produce their effects upon different parts of the body, is proved by experiments made by the late Mr. HUNTER, although he had no idea of their being usually carried there before they produce the different actions so well known to follow their exhibition by the mouth. He found that infusions of the following substances received into the circulation by the jugular vein, immediately produced the same effects which more slowly follow their being taken by the mouth. Infusion of opium brought on drowsiness. Infusion of ipecacuanha vomiting. Jalap vomiting and purging. Infusion of rhubarb a profuse flow of urine. These effects ceased in a few hours, and appeared to have in no respect injured the animal's health. Except the

venereal disease, gout is the only one whose local symptoms have been completely removed by medicine, in so short a time, as to put it beyond all doubt that their removal is the effect of the medicine. The effect of the eau medicinale and of the vinous infusion of the colchicum autumnale on gout, is indeed more rapid than that of mercury on the venereal disease, but in all other respects corresponds with it, and if these medicines act through the medium of the circulation, the only difference may be, that the one is more quickly received into it than the other.

This power of the eau medicinale, which I have stated to be exactly similar to that of the colchicum autumnale over the local symptoms of gout, I have ascertained by experiment more than six times upon myself; at one time the symptoms went off in six hours, at another in 12, and at others in 24 hours.

As we know the sensible effects of mercury, whether it is introduced into the circulation by the absorbents, or received into the stomach, are the same, we conclude whenever these sensible effects are met with, that mercury is actually in the circulation.

It therefore occurred to me, that if the sensible effects of the infusion of the colchicum should prove to be the same, whether it is introduced into the circulation by the jugular vein, or received by the mouth into the stomach, that we might equally in both cases conclude it to be in the circulation. To determine this point, 30 drops of the vinous infusion of the colchicum (made by macerating two pounds of the fresh roots in 24 ounces of Sherry wine, in a gentle heat for six days, the spirit being previously carried off by heat,) was diluted

with a dram of water, and conveyed into the circulation of a moderately sized dog by the jugular vein. The dog's pulse in a natural state is 140 in a minute.

In 5 minutes, the dog had a tremulous motion of the muscles and fluttering of the pulse, accompanied with nausea, but no retching to vomit. In 14 minutes, the pulse was 180 in a minute and had frequent intermissions. In 4 hours, the pulse was 120 in a minute, of its natural strength, and had frequent intermissions. In 7 hours, the dog had a natural motion, the pulse had no intermission, was 140 in the minute. The dog had a good appetite for food, and appeared in perfect health.

The same dog at the end of three complete days, swallowed 60 drops of the same infusion, exactly double the quantity that had been introduced into the circulation. In 2 hours, he became languid, the pulse wiry and weak, but 140 in the minute. In $4\frac{1}{2}$ hours, the languor much less and the pulse natural. In 8 hours, the dog had had a natural motion. In 11 hours, was in good spirits and very well.

The sensible effects, upon the dog, were similar to those produced upon myself, but in a less degree. Under the influence of a violent fit of the gout, in the ankle, on the 23d of December, 1815, at 10 o'clock in the morning, I took 60 drops of the eau medicinale; the pain of the gout was insufferable, I got into bed, and was so chilly as not to be able to keep my hands warm, even under the bed clothes. In 2 hours, I became rather hot and thirsty. In 3 hours, the pain was so much diminished as to be tolerable, while the limb was at rest. In 7 hours, I had a confined motion from the bowels, and the pain in the ankle became severe, while the foot was placed

on the ground, but this went off as soon as the foot was again placed in a horizontal posture. A nausea, or half sickness, came on ; my pulse, which is naturally 80 in a minute, was lowered to 60, and intermitted. In 10 hours, the nausea was gone off, but I remained languid, the pulse beating 70 in a minute. I had some appetite for food.

The following morning, my pulse was 80, and having passed a good night, I was enabled to walk as usual, and follow the duties of my profession.

If these observations shall be confirmed, they must lead us to conclude, that the different kinds of substances, which produce specific diseases, are first carried into the circulation, in the same manner as mineral and animal poisons, and that the medicines by which they are acted upon, go through the same course, before they produce their beneficial effects ; a material step will thus be gained in the consideration of diseases, and the modes of treating them.